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**1202 144**

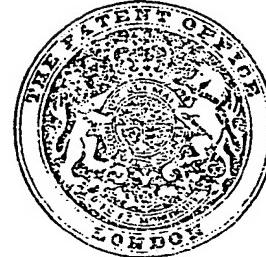
# PATENT SPECIFICATION

(11) **1202 144**

## DRAWINGS ATTACHED

- (21) Application No. 3505/68 (22) Filed 23 Jan. 1968  
 (23) Complete Specification filed 22 Jan. 1969  
 (45) Complete Specification published 12 Aug. 1970  
 (51) International Classification B 21 d 19/04  
 (52) Index at acceptance

B3E 10A15 10E2 1H2 13 13O 83 11 12A 12E 12F 12G



## 5. IMPROVEMENTS IN METHODS FOR THE PRODUCTION OF CYLINDRICAL FLANGED CASINGS OR REELS AND IN APPARATUS THEREFOR

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then welding a flange or flanges around the end periphery or peripheries of the cylinder or reel but such a construction may distort the cylinder or reel and thereby render the cylinder or reel less satisfactory and reduce its efficiency when employed as a fan casing or for other purposes.

The object of the invention is a method for the production of a cylinder or open ended reel having flanges integral with the body.

According to the invention the method comprises forming a sheet of metal into a cylinder or open ended reel, welding the ends of the sheet together longitudinally to form the cylinder or reel, applying a cylindrical expanding mandrel to the interior of the cylinder or reel and expanding the mandrel outwards, mounting the mandrel to rotate about its axis, applying a roller or pair of rollers mounted in a pivotable quadrant plate to rotate on the outer, inner or the inner and outer periphery of one end of the cylinder or reel, and applying a movement to the quadrant plate to gradually rotate the axis or axes of the roller or rollers through 90° to form a beading or rolled edge or flange on the cylinder or reel, the rollers being shaped to produce the required contour.

The invention will be described with reference to the accompanying drawings:—

## ERRATUM

### SPECIFICATION No. 1,202,144

Page 1, Heading, Index at acceptance, after  
 "1H2" insert "B3A"  
 after "83" insert "B3J"

THE PATENT OFFICE  
*15th September 1970*

the cylinder or reel C, chamfering one edge of the sheet, bending the sheet into a cylinder and welding the two edges together to lie flush.

A cylindrical rotatable expandable mandrel A, A<sup>1</sup> is inserted into the cylinder or reel C and expanded outwards to grip the inner surface of the cylinder or reel C.

One end of the cylinder C is positioned by a location stop a<sup>1</sup> mounted on the mandrel.

The mandrel is formed in two parts A, A<sup>1</sup> and is mounted in the cylinder C on a shaft B which extends between the centres of a lathe 1 and is positioned in a chuck.

Each part A, A<sup>1</sup> of the mandrel is fixed on a semi-circular plate a<sup>2</sup> having a semi-circular central recess engaged by a conical wedge member b carried on a sleeve B<sup>1</sup> on the shaft B. Rotation of a nut b<sup>1</sup> causes the sleeve B<sup>1</sup> to force the wedge member b into the recesses in the plates a<sup>2</sup> to expand the mandrel against springs b<sup>2</sup> by moving sleeve B<sup>1</sup> in the direction of arrow X.

A pair of wheels or rollers d, d<sup>1</sup> are mounted on a quadrant plate D affixed to a plate D<sup>1</sup> on the stationary frame of the plate upon which the rotatable mandrel A, A<sup>1</sup> is mounted the quadrant plate D being capable of a movement through 90° in a horizontal plane. The quadrant plate D is formed with teeth d<sup>2</sup> on the arcuate periphery of the plate, en-

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# PATENT SPECIFICATION

(11) 1202 144

1202 144

## DRAWINGS ATTACHED

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## (51) IMPROVEMENTS IN METHODS FOR THE PRODUCTION OF CYLINDRICAL FLANGED CASINGS OR REELS AND IN APPARATUS THEREFOR

(71) I, ERISTOWE BUCKLAND SAXTON, a British Subject, of 37 Higham Lane, Gee Cross, Hyde, County of Chester, do hereby declare the invention, for which I pray that 5 a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to improvements in 10 methods for the production of cylindrical flanged casings and reels and in apparatus therefor.

Cylindrical flanged casings or like structures 15 such as casings for fans or open ended reels have been produced by forming a cylinder and then welding a flange or flanges around the end periphery or peripheries of the cylinder or reel but such a construction may distort the cylinder or reel and thereby render the 20 cylinder or reel less satisfactory and reduce its efficiency when employed as a fan casing or for other purposes.

The object of the invention is a method 25 for the production of a cylinder or open ended reel having flanges integral with the body.

According to the invention the method comprises forming a sheet of metal into a cylinder or open ended reel, welding the ends of the 30 sheet together longitudinally to form the cylinder or reel, applying a cylindrical expanding mandrel to the interior of the cylinder or reel and expanding the mandrel outwards, mounting the mandrel to rotate about its axis, applying 35 a roller or pair of rollers mounted in a pivotable quadrant plate to rotate on the outer, inner or the inner and outer periphery of one end of the cylinder or reel, and applying a movement to the quadrant plate to 40 gradually rotate the axis or axes of the roller or rollers through 90° to form a beading or rolled edge or flange on the cylinder or reel, the rollers being shaped to produce the required contour.

45 The invention will be described with reference to the accompanying drawings:—

[Price 5s. Od. (25p)]

Fig. 1 is a plan view of the apparatus showing the cylinder in position for forming a flange on one end thereof;

Fig. 2 is a plan view showing the cylinder in position after forming a flange on one end thereof;

Fig. 2a is a part transverse section on line 2a—2a Fig. 3;

Fig. 3 is an end view of the mandrel looking in the direction of the arrow X in Fig. 4;

Fig. 4 is a section on line 4—4 Fig. 3. A cylindrical rotatable expandable mandrel A, A<sup>1</sup> is inserted into the cylinder or reel C and expanded outwards to grip the inner surface of the cylinder or reel C.

A cylindrical rotatable expandable mandrel A, A<sup>1</sup> is inserted into the cylinder or reel C and expanded outwards to grip the inner surface of the cylinder or reel C.

One end of the cylinder C is positioned by a location stop a<sup>1</sup> mounted on the mandrel.

The mandrel is formed in two parts A, A<sup>1</sup> and is mounted in the cylinder C on a shaft B which extends between the centres of a lathe 1 and is positioned in a chuck.

Each part A, A<sup>1</sup> of the mandrel is fixed on a semi-circular plate a<sup>2</sup> having a semi-circular central recess engaged by a conical wedge member b carried on a sleeve B<sup>1</sup> on the shaft B. Rotation of a nut b<sup>1</sup> causes the sleeve B<sup>1</sup> to force the wedge member b into the recesses in the plates a<sup>2</sup> to expand the mandrel against springs b<sup>2</sup> by moving sleeve B<sup>1</sup> in the direction of arrow X.

A pair of wheels or rollers d, d<sup>1</sup> are mounted on a quadrant plate D affixed to a plate D<sup>1</sup> on the stationary frame of the plate upon which the rotatable mandrel A, A<sup>1</sup> is mounted the quadrant plate D being capable of a movement through 90° in a horizontal plane. The quadrant plate D is formed with teeth d<sup>2</sup> on the arcuate periphery of the plate, en-

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SEE ERRATA SLIP ATTACHED

- gaging a toothed pinion or a worm wheel  $d^3$  rotated through gearing or the plate D may be rotated by an hydraulic or pneumatic cylinder.
- 5 The rollers d,  $d^1$  are arranged one on each side of one peripheral edge of the cylinder or reel C to be flanged in close contact therewith and as the cylinder or reel C rotates with the mandrel A, A $^1$  form a beading or rolled edge or flange around the periphery of the cylinder. The quadrant plate D is then rotated through the worm gearing  $d^2$ ,  $d^3$  and the rollers d,  $d^1$  apply a bending movement to a peripheral portion of the cylinder until the peripheral edge is turned through 90° from the position shown in Fig. 1 to that shown in Fig. 2 to form a flange c around the periphery, the width of the flange c being determined by the positioning of the wheels or rollers d,  $d^1$ .
- 10 A spring loaded ball  $d^4$  is mounted on a ring  $d^5$  loosely mounted on the worm  $d^3$  to register in recesses in the plate D to indicate any particular angle through which the quadrant plate D has turned on the plate D $^1$ . The quadrant plate D rotates in a groove  $d^6$  in the plate D $^1$ . The plate D $^1$  is moveable longitudinally and transversely in the lathe frame.
- 15 A flange may be applied to the opposite end of the cylinder or reel by withdrawing the cylinder or reel C from the mandrel A, A $^1$  and reversing it thereon and repeating the operation, the already formed flange c engaging the vertical edges of the location stops a $^1$  as shown in dotted lines in Fig. 2a.
- 20 The location stops a $^1$  may be secured to the mandrel A, A $^1$  by bolts a $^2$  passing through sleeves a $^3$  to accommodate the mandrel to differing lengths of cylinders or reels C.
- 25 It has been found that an integral flange or flanges may thus be formed on the open ends of the cylinder or reel C as above described without distortion of the cylinder or reel.
- 30 An integral flanged cylinder or reel is produced by the aforesaid method and apparatus more efficiently, and at less cost than heretofore.
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- forming a sheet of metal into a cylinder or open ended reel, welding the ends of the sheet together longitudinally to form the cylinder or reel, applying a cylindrical expanding mandrel to the interior of the cylinder or reel and expanding the mandrel outwards, mounting the mandrel to rotate about its axis, applying a roller or pair of rollers mounted on a pivotable quadrant plate to rotate on the outer inner or the inner and outer periphery of one end of the cylinder or reel, and applying a movement to the quadrant plate to gradually rotate the axis or axes of the roller or rollers through 90° to form a beading or rolled edge or flange on the cylinder or reel.
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2. Apparatus for the production of cylindrical flanges on casings or reels comprising a cylindrical mandrel formed in two semicircular parts mounted between centres on a lathe or like machine, a quadrant plate mounted on the lathe or like machine, a roller or rollers on the quadrant plate and means for rotating the plate to cause the roller or rollers to bend a flange on a cylinder mounted on the mandrel as it rotates with the mandrel.
3. Apparatus for the production of cylindrical flanges on casings or reels as claimed in Claim 2 in which the mandrel is expanded by a conical member mounted on a sleeve on a shaft about which the mandrel rotates.
4. Apparatus for the production of cylindrical flanges on casings or reels as claimed in Claim 2 in which one end of the cylinder or reel bears against adjustable location stops affixed to the mandrel.
5. Apparatus for the production of cylindrical flanges on casings or reels as claimed in Claim 2 in which the quadrant plate is formed with teeth on its arcuate periphery which engage a worm wheel by which the quadrant plate is rotated in a groove in a plate mounted on a stationary frame.
6. Apparatus for the production of cylindrical flanges on casings or reels as claimed in Claim 2 substantially as hereinbefore described with reference to the accompanying drawings.

**WHAT I CLAIM IS:—**

1. A method for the production of cylindrical flanged casings or reels comprising

J. OWDEN O'BRIEN & SON,  
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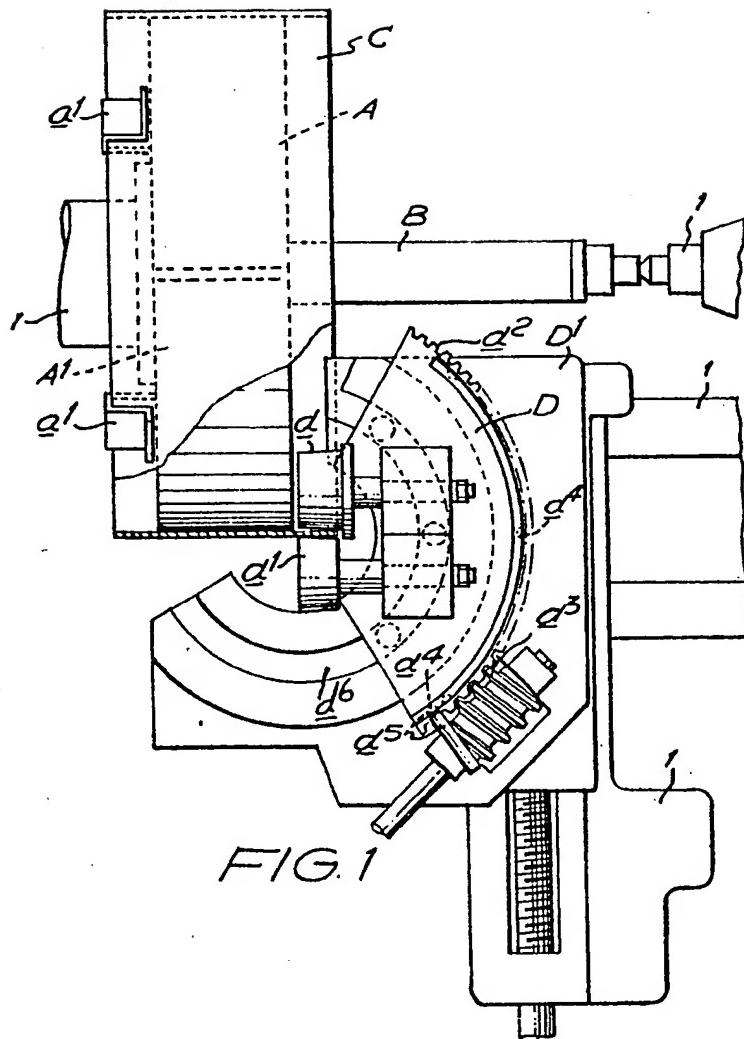
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COMPLETE SPECIFICATION

3 SHEETS

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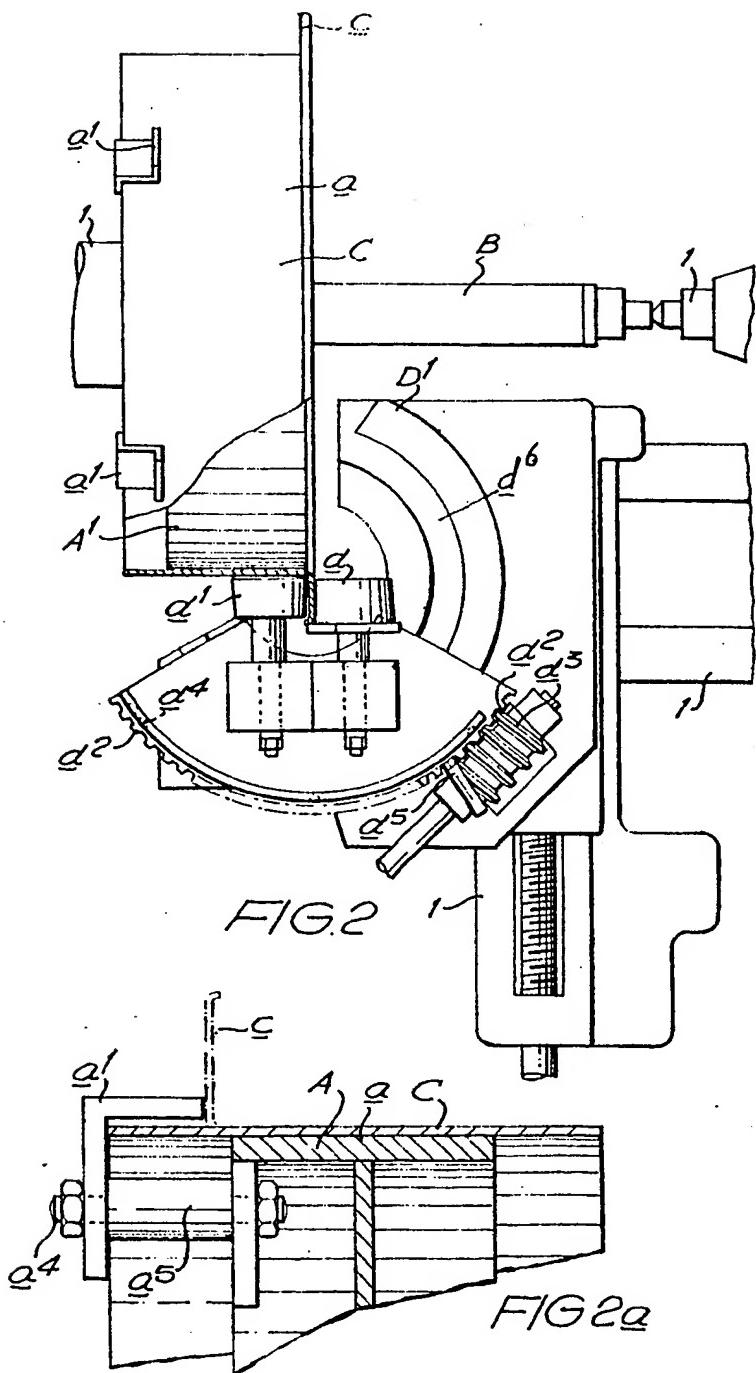
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COMPLETE SPECIFICATION

3 SHEETS

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Sheet 2



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3 SHEETS

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Sheet 3

